

U.S. Patent Application Serial No. 10/087,913
Amendment dated January 6, 2004
Reply to OA of October 6, 2003

REMARKS

Claims 10-17 and 18-34 are pending in this application. Original claims 1-9 have been canceled without prejudice and rewritten as new claims 18-34. Claims 10-17 have been withdrawn from consideration as being drawn to a non-elected invention.

New claims 18-26 correspond to canceled claims 1-6. New claims 27-34 correspond to canceled claims 7-9. No new matter has been added.

In view of the newly presented claims and remarks set forth below, further and favorable reconsideration, is respectfully requested.

I. At page 3 of the Office Action, the Examiner requires affirmation of the provisional election with traverse, to prosecute composition claims 1-9, of Group I.

Applicant's hereby affirm the election of the invention of Group I, claims 1-9, directed to the present composition.

II. At page 5 of the Office Action, claims 1-3 and 5-9, have been rejected under 35 USC § 102 (b), as being anticipated by or, in the alternative, under 35 USC § 103 (a) as obvious over, Fukunaga et al. (5,601,228).

The Examiner states that **Fukunaga** teach solder-precipitating compositions containing Sn-Pb alloy powder containing an organic acid salt of Pb, and the formation of Pb on the surface of the Sn-Pb particles (1-20 μm diameter) and the formation of paste compositions from the powder. The Examiner states that **Fukunaga** expressly or inherently meets all of the presently claimed limitations.

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35 USC § 102:

Anticipation under 35 USC § 102, requires that a single prior art reference meet each and every claim limitation.

Fukunaga teaches a solder precipitating composition requiring at least an Sn-Pb alloy powder, and an organic acid salt of Pb, where the composition is useful for pre-coating pads with a solder layer of uniform and sufficient thickness in a short time, where bridges are not formed.

Claim 1 has been canceled without prejudice and rewritten as new claims 18-21, to incorporate the limitations of canceled claim 3, i.e., to require a base material having a coating material provided thereon.

Fukunaga teaches forming the solder layer from the composition including a flux, by coating the composition on a substrate such as a board and heating the resultant structure to precipitate the solder, i.e., form the solder layer on the board. The board is thereafter cleaned with a solvent. Components are then placed on the board, and the resultant structure is heated to reflow the solder and electrically connect the device.

In view of the foregoing, **Fukunaga** does not teach a coated conductive particle as required by the present claims. Rather, the required ion-exchange reaction of **Fukunaga** takes place when the composition including a flux is provided as a layer on a substrate and heated. Thus, even if a layer of Pb is formed on the Sn-Pb alloy powder, conductive coated particles are not obtained. Rather, a layer of precipitated solder on a substrate, is obtained.

Accordingly, **Fukunaga does not teach conductive coated particles**, as required by the

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proposed new claims 18-21.

New claim 21 requires that the base material consist of a metal selected from the recited group, and thus excludes alloy base materials. **Fukunaga** does not teach or suggest an base or core consisting of a single metal, and in fact requires an alloy core.

Claims 27-34 correspond to canceled claims 7-9. These claims all require a thermosetting resin and/or a thermoplastic resin in combination with conductive particles containing at least two materials.

The Examiner takes the position that **Fukunaga** meets the above limitation by disclosing the formation of paste compositions from the powder. The Examiner points to col. 6, lines 8-19, and the Examples.

Fukunaga does not disclose paste compositions formed from conductive particles containing at least two materials, and containing a *thermosetting* resin and/or a *thermoplastic* resin, as presently required. Rather, **Fukunaga** discloses paste compositions containing a base material, an organic acid salt of Pb, and a natural gum rosin where the ion-exchange reaction does not occur until the paste is coated on a substrate, and the substrate is heated. Thus, **Fukunaga does not** teach a paste composition formed from conductive particles containing at least two materials, as presently required by new claims 27-34. Further, **Fukunaga does not** teach or suggest a thermosetting and/or a thermoplastic resin, as presently required.

In view of the foregoing remarks and new claims 18-34, it is submitted that **Fukunaga** does not teach each and every element of the claimed composition, as required for anticipation under 35

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USC § 102. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

35 USC § 103:

Fukunaga does not suggest coated conductive particles as required by new claims 18-26.

Regarding claims 27-34, **Fukunaga** does not suggest incorporating a thermosetting resin and/or a thermoplastic resin, as presently required.

In view of the new claims and remarks set forth above, it is submitted that nothing in **Fukunaga** suggests the presently claimed invention, within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

III. At page 6, of the Office Action, claims 1-9 have been rejected under 35 USC § 102 (b) as anticipated by or, in the alternative, under 35 USC § 103 (a), as being unpatentable over Wrezel, US Patent No: 5,674,326.

The Examiner states that **Wrezel** discloses a solder paste containing dicarboxylic acid, an indium-containing alloy powder, and an inhibiting agent (Pb, Bi). The Examiner states that the reference either specifically or inherently meets each of the claimed limitations.

35 USC § 102:

Wrezel is directed to a solder paste and requires a flux containing dicarboxylic acid as an activator, a metal alloy powder including a plurality of metal alloy particles including Sn and/or In, and an inhibiting agent (Pb or Bi) which coats the plurality of metal alloy particles and inhibits the

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metal alloy particles from binding with the dicarboxylic acid.

Wrezel does not exemplify forming such metal coated particles. **Wrezel** teaches that the solder paste can contain such coated particles in order to inhibit dicarboxylic acid's reaction with the base material of the coated particle. **Wrezel** does not teach metal coated alloy particles absent the flux containing dicarboxylic acid.

Regarding claims 18-26, these claims have been written to require that the conductive particles "consist essentially of" the recited materials, in place of "comprising" and thus serve to exclude any elements not recited, i.e., the flux of **Wrezel**. **Wrezel** does not teach a coated particle absent the required dicarboxylic acid.

New claim 21 requires that the base material consist of a metal selected from the recited group, and thus excludes alloy base materials. **Wrezel** does not teach or suggest an base or core consisting of a single metal, and in fact requires an alloy core.

Regarding claims 27-34, **Wrezel does not teach or suggest a *thermosetting* resin and/or a *thermoplastic* resin**, as presently required **Wrezel** exemplifies only the use of a natural rosin (See col. 2, line 44).

In view of the new claims and foregoing remarks, it is submitted that **Wrezel** does not teach each and every element of the claimed invention as required for anticipation under 35 USC § 102. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

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35 USC § 103:

Regarding claim 18-26, **Wrezel** does not suggest a coated alloy powder absent **Wrezel's** required flux containing dicarboxylic acid. Regarding claim 21, **Wrezel** does not suggest a core containing a single metal. Rather, **Wrezel** requires an alloy core.

Regarding claims 27-34, **Wrezel** does not suggest a composition containing a thermosetting and/or thermoplastic resin, as presently required.

In view of the new claims and remarks set forth above, it is submitted that nothing in **Wrezel** suggests the presently claimed invention, within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

IV. At page 7, of the Office Action, claims 1-4 and 6, have been rejected under 35 USC § 102 (b), as being anticipated by or, in the alternative, under 35 USC § 103 (a) as being unpatentable over Yamaguchi, US Patent No: 5,962,133.

The Examiner states that **Yamaguchi** discloses In or Bi-coated solder particles and that the reference either specifically or inherently meets each of the presently claimed limitations.

35 USC § 102:

Yamaguchi requires a solder powder having an alloy core containing tin and having one of indium or bismuth, coated on the core.

Claim 1 has been rewritten as new claims 18-21, to exclude Sn from the base material (claim

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18); to exclude In alone or Bi alone, as coating material (Claims 19 and 20), and to require that the base material consists of a metal that is a simple substance selected from the recited metals (claim 21), which limitation serves to exclude an alloy core as taught by all of the applied references.

In view of new claims 18-26, and the remarks set forth above, it is submitted that **Yamaguchi** does not teach each and every element of the claimed invention, as required for anticipation under 35 USC § 102. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

35 USC § 103:

Yamaguchi does not suggest a core power not containing tin (present claim 18), and does not suggest a coating material other than one of indium or bismuth (present claims 19 and 20), because **Yamaguchi** requires a core containing Sn, coated with indium or bismuth alone. Further, **Yamaguchi** does not suggest a core consisting of a single metal, as required by present claim 21.

In view of the new claims and remarks set forth above, it is submitted that nothing in **Yamaguchi** suggests the presently claimed invention, within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Amendment Transmittal

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